

REMARKS

Claims 1-22 are pending in the present application. Claims 1 and 8-12 have been amended. No claims have been added and no claims have been canceled. Reconsideration of the rejection is respectfully requested in view of the above amendments and the following comments.

I. 35 U.S.C. § 112, First Paragraph

The Examiner has rejected claims 1-22 under 35 U.S.C. § 112, first paragraph, as failing to comply with the written description requirement. The Examiner states that the "claim(s) contains subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention". The Examiner further states:

Newly amended claim 1 recites the following:

the management information may be manipulated at a plurality of nodes that are in a plurality of different locations within the virtual stored data management system substantially simultaneously

However, the present specification does not clearly state that the management information is manipulated at a plurality of nodes. The specification only recites the management information being manipulated at a plurality of different locations.

Office Action dated October 7, 2004, page 3.

By the present Amendment, the specification and claims have been amended to provide proper support in the specification for all terminology used in the claims. In particular, the specification has been amended at page 5, lines 12 and 16 to clarify that management information may be manipulated "at nodes that are in several different locations". In addition, the paragraph extending from page 25, line 1 to page 26, line 18 of the specification has been amended at several locations to also clearly recite that management information is processed or stored at nodes that are in various locations

including in a network, in a controller, in a server, and in a storage element. These amendments to the specification are all fully supported by terminology in claims 8-12 as originally filed in the application; and, accordingly, do not add new matter to the application.

In addition, independent claim 1 and dependent claims 8-12 have been amended to avoid the phrase "at a plurality of nodes" so as to more clearly track the language in dependent claims 8-12 as originally filed. Thus, claim 1 now recites that the management information may be manipulated "at nodes that are in a plurality of different locations within the virtual stored data management system substantially simultaneously", and dependent claims 8-12 have been amended to use substantially the same terminology as used in the originally filed claims.

In view of the above amendments to the specification and claims, Applicants believe all the claims in the application are fully supported by the specification, and that both the specification and claims fully satisfy the requirements of 35 U.S.C. § 112, first paragraph.

Therefore, the rejection of claims 1-22 under 35 U.S.C. § 112, first paragraph has been overcome.

II. 35 U.S.C. § 103, Obviousness

The Examiner has rejected claims 1-22 under 35 U.S.C. § 103(a) as being unpatentable over Voigt et al. (U.S. Patent No. 5,960,451) and Jacobson et al. (U.S. Patent No. 5,392,244) or Kirby (U.S. Patent No. 6,526,478), each taken separately. This rejection is respectfully traversed.

In rejecting the claims the Examiner states the following:

Voigt teaches the claimed "one or more hosts" as computer 22 and/or computers coupled to network 36. The claimed "plurality of data storage elements" correspond to memory 44, 42 and data storage system 24. The claimed "host network attachment" corresponds to circuitry inherently found in computer system 20 for connecting the memory to the network. The claimed "storage server/controller" corresponds to circuitry including RAID management system 56 and/or controllers 54a, 54b. The

claimed "permanent data storage media" corresponds to non-volatile memory 44. The claimed "management information" corresponds to parameters/preferences such as physical capacity, number of storage disks, allocated capacity, characteristics of the RAID, percentage to be used (col. 2, line 55 – col. 3, line 2), performance (col. 4, line 16) and availability (col. 7, lines 26-42). The claimed "units of data" corresponds to the logical storage units (LUNs). The claimed function of "management information may be manipulated" corresponds to altering characteristics/parameters of the RAID or logical storage units (LUNs).

Office Action dated October 7, 2004, pages 4 and 5.

The Examiner acknowledges that Voigt does not disclose "virtualization means for converting a storage request to a virtual volume into a storage request to at least one data storage element of said plurality of data storage elements" as recited in claim 1 of the present application. The Examiner asserts, however, that the claimed virtualization means is disclosed in both Jacobson and Kirby, and contends that it would have been obvious to one of ordinary skill in the art to use Jacobson's or Kirby's memory mapping scheme in Voigt to improve I/O performance. This rejection is respectfully traversed.

Claim 1, as amended herein, reads as follows:

1. A virtual stored data management system, the virtual stored data management system comprising:
 - one or more hosts;
 - a plurality of data storage elements functionally coupled to the one or more hosts, wherein the plurality of data storage elements include a host network attachment, a data transfer system, at least one of a storage server and a controller, and a permanent data storage media, wherein the permanent data storage media is organized with management information uniquely associated with units of data such that the management information may be manipulated at nodes that are in a plurality of different locations within the virtual stored data management system substantially simultaneously; and
 - virtualization means for converting a storage request to a virtual volume into a storage request to at least one data storage element of said plurality of data storage elements.

By the present Amendment, claim 1 has been amended to clarify that the management information may be manipulated "at nodes that are in a plurality of different

locations within the virtual stored data management system substantially simultaneously”; and, in addition, the specification has been amended, as indicated above, to fully support this terminology in claim 1.

Voigt does not disclose or suggest a virtual stored data management system that includes a permanent data storage media “organized with management information uniquely associated with units of data such that the management information may be manipulated at nodes that are in a plurality of different locations within the virtual stored data management system substantially simultaneously” as now recited in claim 1. Voigt does not disclose that management information may be manipulated at nodes that are in a plurality of different locations within a virtual stored data management system, and does not disclose that the management information may be manipulated at nodes that are in the plurality of different locations substantially simultaneously.

Voigt is directed to a hierarchical RAID data storage system, and, in particular, to a system for reporting available capacity and current RAID configuration to an administrator so that the administrator can make informed decisions concerning creation or reconfiguration of current logical storage unit (LUN) characteristics. In Voigt, an administrator can propose different configurations with one or more hypothetical LUNs without actually creating the LUNs. The system reports changing available capacity as the administrator varies the characteristics of the hypothetical LUNs; and, assuming available capacity, the administrator can create new LUNs having the same characteristics as the hypothetical LUNs.

Voigt is concerned with how characteristics/parameters of the RAID or LUNs are to be altered to change available capacity, i.e., how information is to be manipulated. The present invention, on the other hand, is directed to where management information may be manipulated. Voigt is not concerned with where the processing of management information takes place in a data management system and does not disclose or suggest that management information may be manipulated at nodes that are in a plurality of different locations within a virtual stored data management system substantially simultaneously, as now recited in claim 1. Only the present application contains any such disclosure.

In the Office Action, the Examiner suggests that Voigt's management information "is information that takes up many storage locations within memory", and that a "change to a single parameter would necessarily involve changes to different memory locations substantially simultaneously" (Page 8 of Office Action dated October 7, 2004).

Even construing Voigt in this manner, Voigt still does not disclose a virtual stored data management system that includes a permanent data storage media "organized with management information uniquely associated with units of data such that the management information may be manipulated at nodes that are in a plurality of different locations within the virtual stored data management system substantially simultaneously" as now recited in claim 1.

Jacobson and Kirby were applied as disclosing the claimed "virtualization means" of claim 1. Jacobson and Kirby also do not disclose or suggest that management information may be manipulated at nodes that are in a plurality of different locations within a virtual stored data management system substantially simultaneously; and, thus, fail to supply the deficiencies in Voigt. Accordingly, the cited art, considered alone or in combination, fails to disclose or suggest the subject matter of claim 1, and claim 1 should be allowable in its present form.

Claims 2-22 depend from and further restrict claim 1 and should also be allowable in their present form, at least by virtue of their dependency. Several of the dependent claims, however, recite additional subject matter not disclosed or suggested by the cited art. For example, each of claims 8-12 recites that management information manipulation is performed or stored at a node at a particular location; i.e., at a "connecting network", at a "storage server", at a "storage controller", in a "storage element" and in a "permanent data storage media". The subject matter of these claims are not disclosed in or obvious over the cited references as discussed above, and these claims should be allowable in their own right as well as by virtue of their dependency.

Therefore, the rejection of claims 1-22 under 35 U.S.C. § 103(a) has been overcome.

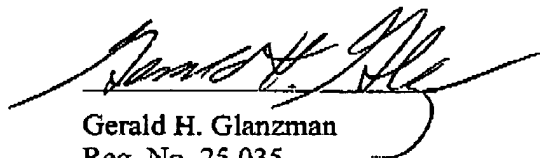
III. Conclusion

It is urged that the subject application is patentable over Voigt et al. and Jacobson et al. or Kirby, each taken separately and is now in condition for allowance, and it is respectfully requested that the Examiner so find and issue a Notice of Allowance in due course.

The Examiner is invited to call the undersigned at the below-listed telephone number if in the opinion of the Examiner such a telephone conference would expedite or aid the prosecution and examination of this application.

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Respectfully submitted,



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